

## 60-11 Variable Intensity Polymerizer Light Curing Unit (VIP) (Project 99-14) (4/00)

BISCO Dental Products has recently introduced the Variable Intensity Polymerizer Light Curing Unit (VIP). The VIP is a microprocessor-controlled, visible light curing unit that has been designed and marketed for the pulse-delay cure technique for resin composites. The pulse-delay polymerization method is touted to reduce composite polymerization stress by first curing the composite for a short duration at low intensity (eg, three seconds at 100-200 mW/cm<sup>2</sup>). Three minutes are then allowed to pass, during which time the composite is finished. The final cure is accomplished by exposing the resin to the light for 30 seconds at 500-600 mW/cm<sup>2</sup>. BISCO provides pulse-cure mode settings for a variety of conventional and posterior packable resin composites. Programs, curing intensity, and curing time may be set using either the handpiece or the base unit. Two pulse-cure settings can be programmed, but the VIP may also be used in a conventional continuous curing mode with irradiance settings from 100 to 600 mW/cm<sup>2</sup> in 100mW increments. Curing time can be set to 2, 3, 4, 5, 10, 20, and 30 seconds, but the light can also be set in a continuous curing mode up to 255 seconds. Both eight- and eleven-millimeter curing tips are available, and the manufacturer states that the VIP is compatible with Demetron tips. This unit also features a built-in radiometer that is said to automatically calibrate the power of the VIP to ensure the intensity output is accurate. The VIP is purported to be the first VLC unit that offers advanced diagnostics, a feature than may help users determine the cause of malfunctions in its operation. The advanced diagnostics also provide information on bulb life usage history, bulb filament status, and "headroom" reading (ie, the difference between maximum bulb output and present calibrated output -- said to be a measure of the unit's reserve power). BISCO claims that the VIP operates at less than full capacity, which is purported to reduce wear and extend the service life of the bulb and other electrical components.



### Manufacturer:

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### Retail Price:

\$995.00 VIP Curing Unit (product number V-10120K)  
- 1 VIP base unit and handpiece  
- 1 11-mm, 55-degree, curved fiber-optic light probe  
- 1 protective light shield  
- 1 (12V/75W) replacement lamp  
- 1 detachable power cord  
- 2 replaceable fuses (250V, T 1.6 A)  
- 1 operators manual

### Government Price:

\$847.75 (Same items as above)

**ADVANTAGES:**

- + Designed to be utilized with the pulse-delay polymerization method.
- + Offers diagnostic (i.e., trouble-shooting) features not seen with other VLC units.
- + Irradiance settings can be adjusted from 100 to 600 mW/cm<sup>2</sup>.
- + Self-calibration feature refines irradiance output.
- + Has a wide range of timer settings.
- + Built-in digital readout radiometer.
- + LCD display.
- + Ergonomically-designed handpiece.
- + Sterilizable curing tips.
- + Internal voltage regulator.
- + Light shield is easily positioned.
- + Designed for easy bulb change or filter inspection.
- + 360-degree-swiveling curing tips.
- + Cooling fan operation is proportional to bulb usage.
- + Quiet cooling fan.
- + Easily cleaned or barrier protected.
- + Passed all electrical safety standard testing.

**DISADVANTAGES:**

- Use is too complicated for the usual federal services multi-user environment.
- Best suited for single-clinician use.
- Provides only minimally adequate irradiance with 13-mm curing tip at full power.
- Built-in radiometer is inaccurate when used with tips having a diameter smaller or larger than 11 mm.
- For average clinical use, unit's additional diagnostic features do not justify its relatively high cost.

**SUMMARY AND CONCLUSIONS:**

The VIP curing unit is marketed to provide clinical flexibility to match newer resin composite curing techniques, most notably the pulse-delay polymerization method. The VIP is a well-designed, ergonomic unit that is easily positioned to reach all areas of the oral cavity. The unit offers advanced diagnostic features and self-calibration that are not usually seen with the typical VLC unit. Testing found that the VIP's irradiance values were acceptable with the 11-mm tip, however the 13-mm tip did not produce irradiance values high enough to adequately cure microfilled resin composites. The internal radiometer gave accurate readings for the 11-mm tip but produced erroneous readings for tips that were larger or smaller. All evaluators rated the VIP as "Good," but none recommended the unit be purchased for general use in their respective clinics due to its operational complexity. Because of its complexity, a majority of users thought that the VIP is best for a clinical setting where it is used consistently by a single operator. Although the diagnostic features of this unit were appreciated, all evaluators thought that for routine clinical use the additional features of this product do not justify its relatively high cost. The **VIP** is rated **Acceptable** for use by the federal dental services.